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METEOR OF MAY 7, 1916, IN EASTERN MISSISSIPPI.

By J. H. JAQUA, Observer.

[Dated: Weather Bureau, Meridian, Miss., June 16, 1916.]

An unusually brilliant meteor moved in a southwesterly direction over western Alabama and eastern Mississippi at about 9:05 p. m. on May 7, 1916. Most witnesses who have made reports of their observations of the phenomenon agree that the meteor was first seen in a position about 45° to 60° above the horizon, and that it was visible a few seconds, probably not more than 10, disappearing in a southerly to westerly direction, below the horizon.

In color it is described as having been a brilliant yellowish white, likened in intensity by some observers to several full moons, by others comparable with a powerful automobile light or a searchlight. The illumination was sufficient to make objects visible as in bright sunlight.

Some people state that the meteor consisted of two spherical portions, which burst about the time it vanished. It is also stated by a few witnesses that sounds produced by the explosion (?) were heard. A luminous train accompanied the meteor.

Usually the details obtainable for the preparation of an article on a certain meteor must be taken from the reports of witnesses, who, as a rule, are not prepared or able to give descriptions from which accurate elevations may be deduced, but in the case of the meteor of May 7 the particularly interesting and valuable description given below has been furnished by Mr. Jesse G. Whitfield, a civil engineer of Demopolis, Ala.

METEOR OF MAY 7, 1916, AT DEMOPOLIS, ALA.¹

By JESSE G. WHITFIELD, C. E.

[Dated: Demopolis, Ala., May 13, 1916.]

I see in the local paper [Demopolis Times] that the meteor which passed this latitude on the night of May 7 at about 9:05 p. m., Central Time² was also seen by residents of Mobile, Ala.

Leaving out the rising and setting of the sun, and the movement of the other heavenly bodies, to which we are now become so accustomed and at which we have ceased to wonder, I can only describe the passage of this meteor as the most magnificent of all the phenomena that I have as yet seen.

I live in the country, and on Sunday night last [May 7, 1916] was returning home from a walk to my neighbor's, when suddenly³ the whole world seemed illuminated as if another sun had sprung into existence. I was walking toward the east, and stopped abruptly, not realizing what had happened. The body of the meteor first appeared to me in a due easterly direction, and at an elevation of 60° above the horizon (30° east of the zenith). It had an apparent diameter of perhaps one-fourth or one-third that of the moon, and in its wake was a tail of diminishing brightness some 10° in length. The meteor disappeared behind the top of a tree that stood about half a mile from me—a tree that I knew and could again identify. Without moving in my tracks, I dug a hole in the ground with my pocketknife, and next morning, with an instrument, found the bearing of the tree

from the hole to be S. 20° W. Probably 10 seconds elapsed from the time of its passing my own latitude to the time of its disappearance at or near the horizon. I made the instrumental observation, hoping that some one in a widely different longitude might also note the direction of the meteor, when it appeared and when it disappeared, thus furnishing data that would enable us to approximate its distance. The meteor passed here at 5 minutes past 9 Central Time, within three minutes of the truth. My position, north latitude $32^{\circ} 29'$, west longitude $87^{\circ} 52'$, is $\frac{1}{4}$ mile north, and $\frac{1}{4}$ mile west, of the southeast corner of section 34, township 18 north, and range 2 east (St. Stephen's survey). My position as given in latitude and longitude would be of interest to those who may have observed the meteor in its passage over the Gulf, supposing that it got that far away.

The diameter of an incandescent body that could have illuminated Sumter County and Marengo County, and probably a belt even wider, as I suppose this must have done, would have been considerable. If we assume that the meteor was 40 miles above the earth when I first saw it in an easterly direction, its distance from me must have been 46 miles, and this being true, if its apparent diameter were one-fourth that of the moon, its actual diameter must have been 570 feet. Now, it is probable that a globe of white-hot matter much inferior to this in size, and at the distance assumed, could have been sufficient to give such intense illumination to a considerable portion of the State of Alabama.

If the assumed distance be correct, the meteor must have passed directly overhead (through the zenith) at a point some 6 miles east of Uniontown, or about halfway between Demopolis and Selma, and when in that part of its trajectory, to an observer in Selma, it must have appeared in the west 60° above the horizon. If a person in Selma or in Montgomery could have observed the meteor as it crossed this latitude, its distance could be known with an approximation proportional to his ability to estimate its angle of elevation, provided, of course, that the distance was not very much greater than that of my assumption. * * *

While the matter constituting the tail of the meteor may have been visible before it lost its brilliancy by cooling, it was probably not possible to distinguish between this and the optical illusion caused by the rapid motion of a bright object. When a firebrand is waved rapidly it appears as a ribbon of fire, and so the meteor would apparently leave behind it a band of light. The impression made on the retina of the eye is not instantly effaced, but remains for an appreciable time. * * *

Mr. B. A. Wooten, of the department of physics at Auburn, Ala., writes me that he saw this meteor, but does not give any estimate of its position. His statement to the effect that it gave no sensible illumination at Auburn, coupled with my own observations, only proves that the meteor passed between me and Auburn, and very much nearer to me than to Auburn.

I have been trying to form some proper notion of the angular velocity of this meteor. I devised a pendulum that would beat seconds, and accustomed myself to counting synchronously with its oscillations. Then with two straight laths nailed together, so as to open out like a V, I made three trials with results of 16° , $18\frac{1}{2}^{\circ}$, and $21\frac{1}{2}^{\circ}$, respectively, the mean of these trials being 18.8° . The mean of another series of trials was 20° . Of course, these were the crudest sort of observations. All I could do was to sight along the laths and open them out to the angle that it seemed must have been described by the meteor in an estimated one second. But if we assume

¹ Extracts from the Demopolis (Ala.) Times of May 18, 1916, supplemented by private advices from the author.

² Mr. Whitfield also calls this "clock time of the 90th Meridian."

³ This statement might be modified somewhat, for the light from the meteor did not flash up to its full brightness instantaneously as if a great electric light had been turned on, but gradually increased through perhaps two seconds, and this gradually increasing illumination caused me to stop walking and to look at the heavens. I would say that the illumination was at its height a little after the meteor passed my latitude.—J. G. W., letter of July 7, 1916.

that the meteor was 46 miles away when first seen, and when moving in a path almost perpendicular to the line of sight, the tangent of 19° on a radius of 46 being about 16, we must conclude that the velocity of the meteor when first seen was about 16 miles per second.

The meteor passed from my latitude to the horizon in an estimated 10 seconds. *It surely passed Mobile long before it reached my horizon.* Mobile, from my point of observations, bears S. $5^\circ 03'$ W., distant 127 miles. From the point 6 miles east of Uniontown, Ala., Mobile bears S. $16^\circ 42'$ W., distant 129 miles (this is taking no account of the spherical form of the earth), and in its passage from this last point to the latitude of Mobile, with the assumed velocity, the meteor would have consumed only about 8 seconds. An object only 2 miles above Mobile would have been in my horizon.

After the disappearance of the meteor my first thought was to get a lamp and note the time. I had thought of listening for a sound, but at the moment it did not occur to me that I would have to wait probably from three to five minutes for the sound to get to me; so I heard none.

When the direction of the disappearance was taken the variation of vernier of the instrument was set for $4^\circ 30'$ E. That is to say, my assumed meridian ran N. $4^\circ 30'$ W. of the magnetic.

Note of July 7, 1916.—Shortly after the appearance of this meteor I was in *Faunsdale, Ala.*, a place 16 miles east of my point of observation, and from what I could learn it does not seem that the apparent position of the meteor as seen from that place, was different from that of my observation. I did not have the opportunity, however, of consulting one gentleman who is said to have had a good view of it while sitting on his front porch. His front porch faces due east.

WORK OF THE AMERICAN METEOR SOCIETY IN 1914 AND 1915.¹

By CHARLES P. OLIVIER.

[Dated: Leander McCormick Observatory, University of Virginia.]

The year 1915 saw a very great increase in the interest in the study of meteors, which was evidenced by the large number of observations made by members of the American Meteor Society. This gratifying increase became largely possible on account of a grant to Dr. S. A. Mitchell, of the Leander McCormick Observatory, from the J. Lawrence Smith fund of the National Academy of Sciences. This appropriation, which was made in April, 1915, permitted the work of the Meteor Society to obtain wider publicity by the publication and distribution of bulletins, maps, and blanks to prospective members.

As a consequence it is believed that the largest amount of systematic work ever done in one year in America was sent in; the results of these observations have been prepared for publication and are now awaiting printing. Briefly, this publication will contain the results from 540 observations made by 4 persons in 1914 and from 5,003 observations made by 36 persons in 1915. While most of these 36 persons are amateurs, 5 have had astronomical training, one is a colonel in the United States Army, one is an observer of meteors in the United States Weather Bureau of wide experience, three are students in astronomy at the University of Virginia, and several others are trained in various scientific lines which would make their work the more valuable. The observers were stationed in

17 States, two Provinces of Canada, and one in the Argentine Republic. It might be added that the Meteor Society has members in several foreign countries and several dozen more in America from whom no reports have yet been received, while a week rarely passes without a new person applying for membership.

From the 5,543 observations of meteors mentioned we have been able to deduce 139 radiant of sufficient accuracy to calculate parabolic orbits for the meteor streams they represent. These orbits are contained in full in one of the tables. Following this is a table containing 81 less certain, but probably existent radiant, for which as yet no orbits are calculated. Other tables contain analyzed data of the distribution of meteors as to magnitudes and average durations of their times of visibility. There is also a table containing a few real heights, which were obtained in August, 1915, between Richmond, Va., University of Virginia, and Washington, D. C. This latter work we hope to repeat on a larger scale and under better conditions during the summer of 1916. The text of the publication contains details as to the organization, plans, and methods of reduction of the work. It further contains full explanations as to the derivation and use of the figures found in the tables. Actual directions to the members were omitted, since these had been printed at great length both in "Popular Astronomy" and also in Bulletins 2-5 of the Meteor Society, which were distributed to all members and applicants.

The present publication and the two similar ones previously prepared by me will bring up the number of results to 440 parabolic orbits of meteor streams, based on about 14,000 meteors. The peculiar value of this contribution lies in the fact that a fairly uniform plan has been followed by all the observers, and that the results were computed and deduced by one person using the methods and care with which other astronomical work is handled in all regular observatories.

It may be of interest to mention the various methods used to reach amateurs who might care to join in the work. At the very organization of this society, the co-operation of the members of the Meteor Section of the Society for Practical Astronomy was secured by the appointment of the writer as director of the latter. Then, last spring a number of articles were published by Dr. S. A. Mitchell and myself calling attention to the desirability of cooperation on the part of all amateurs. These articles appeared in the "Scientific American," "Journal of the Royal Astronomical Society of Canada," and "Popular Astronomy;" by reprinting them in part or in whole, the press of the country assisted in bringing our work to the notice of amateur observers and, as a result, wide publicity was secured. Not less than 200 people have written letters on the subject to date, over half desiring to join in making observations. It goes without saying that many have never been heard from again, but so many have worked with real enthusiasm and success, that it would seem that the future of meteoric astronomy is brighter at the present time than ever before, so far as America is concerned. This is peculiarly fortunate at such an epoch when similar societies in Europe must be greatly reduced in membership and activity.

Having secured the approbation and support of the National Academy of Sciences for the coming year, through a further grant from the J. Lawrence Smith fund, it is hoped that the results for 1916 will surpass those for the previous year, and indeed a good start has been made in that direction. We still need and desire the help of other persons interested in such work and a cordial invitation is again extended to them.

¹ Reprinted from Proc. Natl. Acad. Sci., Washington, July, 1916, 2: 372-4.